STATE OF NORTH CAROLINA
# DEPARTMENT OF TRANSPORTATION

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MEMORANDUM TO: Project Engineers
Project Design Engineers

FROM: G. R. Perfetti, P. E.
State Bridge Design Engineer

DATE: September 19, 2002

SUBJECT: PRESTRESSED GIRDERS WITH 0.6"ϕ DEBONDED STRANDS

To reduce difficulties encountered when producing large prestressed girders with draped strands, girder producers shall have the option to manufacture prestressed girders with debonded straight strand patterns. Therefore, AASHTO Type V and VI girders, and 63" (1600mm) and 72" (1829mm) Modified Bulb Tee girders designed using a ½"ϕ draped strand pattern shall also be designed and detailed with an optional 0.6"ϕ debonded straight strand pattern. The shear shall be investigated and detailed separately for both type strand patterns.

When designing debonded strand patterns, the following criteria shall apply:

- The number of debonded strands shall preferably not exceed 25% but never more than 30% of the total number of strands.
- The number of debonded strands in any row shall not exceed 40% of the total number of strands in that row.
- The exterior strands in each horizontal row shall be fully bonded.
- Debonded strands and corresponding debond lengths shall be symmetrically distributed about the centerline of the member.
- Debonded strands in a given row shall be separated by at least one fully bonded strand.
- The number of debonded strands terminated at a given section shall not exceed four.
- The minimum debond length shall be four feet and subsequent lengths shall vary in two feet increments.

When girders of the same size and similar length are used within a certain bridge or within bridges of the same project, consideration should always be given to using the same number of strands.

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When extending a girder type with ½”ϕ draped strands to its full capacity, a 0.6” ϕ debonded straight strand pattern may not be adequate for the same capacity. In this case, design the girder with 0.6”ϕ draped strands in order to reduce the total number of strands.

New standard drawings, PCGD7(SM), PCGD8(SM), PCGD9(SM), and PCGD10(SM) detail debonded strands and shear requirements in AASHTO Type V and VI girders, and 63" (1600mm) and 72" (1829mm) Modified Bulb Tee girders, respectively. The standard drawings are available on both the Sd drive (S:) and the Structure Design Homepage.

This policy is effective with all new plans prepared but not later than the July 2003 letting. The Design Manual will be updated at a later date.

GRP/JTE

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Attachments